

- G. Thurston and K. Ito. (New York University) Two-stage random-effects meta-analysis.

Each of the three groups has approached meta-analysis in a rigorous fashion, while using somewhat different methods. To ensure the robustness of the findings from meta-analyses of ozone-mortality relationships, this pilot will evaluate and characterize the findings from three independent research groups and methodologies. Results of this pilot will be distributions of the percent increase in daily all-cause and/or cause specific mortality associated with a 10 ppb decrease in daily one-hour maximum, or multi-hour average ozone.

In the case of the C-R function relating ozone and premature mortality, the meta-analytic approaches may be capable of characterizing certain elements of uncertainty, including sampling error and cross-location heterogeneity, but there are likely additional sources of uncertainty that should be characterized, including the influence of co-pollutants and biological plausibility of mortality impacts at relatively low ozone concentrations. These elements may need to be addressed through some subsequent use of expert elicitation methods. The outputs of the meta-analyses might be used as inputs to the expert elicitation process, providing a common base of empirical data for the experts to consider in making their probability judgments.

Valuation of Reductions in the Risk of Premature Death from Air Pollution

The third proposed pilot is intended to address the uncertainties surrounding the value of reductions in the risk of premature death from air pollution, commonly referred to as the value of a statistical life (VSL). Of particular concern is the uncertainty in transferring values revealed in the context of on-the-job risks (through hedonic wage-risk studies), which are based on working age individuals in a largely voluntary risk environment, to an air pollution risk context where at risk individuals tend to be older than the average age worker and the risks are largely involuntary. Additional sources of uncertainty include the relationship between remaining life expectancy and VSL and the impact of quality of life on values for fatal risk reductions. [We are proposing a meta-regression analysis of existing VSL estimates in the economics literature and a more comprehensive examination of the VSL literature. As mentioned previously, EPA has sponsored reviews of this literature. We will also review other recent meta analyses discussed previously. We provide more details on the meta-regression analysis below.](#)

Meta-regression Analysis: EPA has recently completed a meta-analysis of the VSL literature (Kochi, Hubbell, and Kramer, 2003). [Does the SAB think that EPA should include Kochi et al. 2003 if not accepted for publication in a peer reviewed journal by the time the final 812 report is completed?](#) As outlined in Chapter 8, [the Kochi et al](#) meta-analysis used empirical Bayes pooling methods to combine estimates from 40 wage-risk and stated preference studies into a single distribution, taking into account both within-study and between study variability. Pooled effect estimates of the kind generated by this type of meta-analysis can provide an improved central tendency estimate of VSL and a better estimate of variability around the central tendency, but do not systematically address or systematically eliminate between-study variability that may be associated with choice of estimation method and model, study location, target

[continue on 9-17 – June 26 revised]

9-16 – June 26 revised